

# ALTERNATIVES

Testimony of Suzanne Phinney, D.Env.

## SUMMARY OF CONCLUSIONS

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In the analysis of the Orange Grove Project, staff examined nine alternative project sites, as well as several alternative generation technologies, including renewable technologies which do not burn fossil fuels. Staff also analyzed linear route alternatives. Lacking a significant environmental impact associated with the proposed project, the alternative sites and generation technologies would not result in an environmentally superior project.

Staff analyzed nine sites in the San Diego Gas & Electric (SDG&E) service territory as potential alternatives. Six of the sites (Borrego Springs, Miramar, GCL South, Margarita, Rainbow, and San Luis Rey) were not suitable. They have insufficient space/generation capacity, land use restrictions, or extensive infrastructure requirements. The other three sites (GCL North, Talega, and Sycamore) offer some advantages and disadvantages, but overall have more impacts than the proposed site.

Alternative generation technologies and cooling systems were evaluated for water savings. Use of GE LM6000PD non-SPRINT gas turbine generators equipped with dry low emission combustors in place of the proposed technology would reduce water consumption, but would also decrease the overall output. More units (with a potentially greater footprint) would be required to produce the 96 MW expected from the proposed Orange Grove Project.

Renewable technologies (solar, wind, geothermal, biomass, tidal, and wave) were examined as possible alternatives to the project. Although viable technologies that can reduce environmental impacts, they would not apply to the site in the San Luis Rey River canyon. The canyon has poor solar and wind resources, and does not provide the extensive flat acreage required for solar facilities. Biomass would be impractical due to small generation capacity and the need to truck biomass fuels from outside the area. There are no adequate geothermal resources, and tidal and wave technologies would not apply to the inland site. Consequently, staff does not believe that these various renewable technologies present feasible alternatives to the proposed project.

Alternative linear routes were considered, but not retained. The proposed transmission, gas pipeline, and water supply routes would be more practical and of less impact to the environment than any alternative alignments. Conservation and demand side management measures – which include programs that increase energy efficiency, reduce electricity use, and shift electricity use away from peak hours of demand – were also considered. While a great variety of federal, state, and local demand side management programs have been adopted, these programs are not sufficient to satisfy future electricity needs. Additionally, staff believes that the “No Project” alternative is not superior to the proposed project. The “No Project” scenario would likely delay development of reliable electrical resources required for the region and could impede the ability to serve peak load demands in the SDG&E service area.

Therefore, staff does not recommended alternative generation technologies or sites over the proposed Orange Grove project.

## INTRODUCTION

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### CALIFORNIA ENVIRONMENTAL QUALITY ACT CRITERIA

Energy Commission siting regulations require the examination of the “feasibility of available site and facility alternatives to the Applicant’s proposal which substantially lessen the significant adverse impacts of the proposal on the environment” (Title 20, California Code of Regulations, § 1765).

*CEQA Guidelines* Section 15126.6 (a) (Title 14, California Code of Regulation) requires an evaluation of “a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project.” In addition, the analysis must address the “no project” alternative (Title 14, California Code of Regulation, § 15126.6(e)).

The range of alternatives is governed by the “rule of reason,” which requires consideration only of those alternatives necessary to permit informed decision-making and public participation. *CEQA Guidelines* state that an environmental document does not have to consider an alternative of which the effect cannot be reasonably ascertained and of which the implementation is remote and speculative (Title 14, California Code of Regulation, §15126.6 (f) (3)).

### PROJECT DESCRIPTION AND SETTING

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The Orange Grove Project is a 96 MW simple cycle electric generating plant, designed as a peaking facility. The Project is being put forth by Orange Grove Energy, L.P. (Orange Grove Energy), a limited partnership owned by J Power USA Development Co., L.P. through intermediate entities. The 96 MW plant would generate electricity with two GE LM6000 PC SPRINT CTGs (simple-cycle combustion turbines equipped with SPRINT power boost technology to increase output during warm or hot weather). The two turbines would be limited to a combined total of six starts per day and 6,400 hours of annual operation. The plant is expected to operate 60 days of the year.

The 8.5-acre site is adjacent to State Route 76 (SR 76) (Pala Road), two miles west of Pala in northern San Diego County. The Site is situated within a 202-acre property owned by SDG&E, on a former citrus grove bordered by non-native grassland and coastal sage scrub. The San Luis Rey riverbed is on the opposite side of the highway. Ridges up to 1,700 feet surround the Site to the northeast, north, and west. Three residences are located 0.4 to 0.6 miles on a ridgeline above the site. A 0.3 mile underground electric transmission line would connect to a 69-kV bus at the existing Pala substation (on a contiguous parcel to the south), and a 2.4 mile natural gas pipeline would link to an existing SDG&E transmission main. The project would also include a freshwater and a reclaimed water pickup station at Fallbrook Public Utility District

facilities, where water trucks would be filled for hauling to the site. The one-way driving distance would be 15.6 miles from the reclaimed water station and nine miles from the freshwater station. (OGE2008a, section 1.0)

## **DETERMINING THE SCOPE OF THE ALTERNATIVES ANALYSIS**

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To prepare this alternative analysis, staff used the methodology summarized below:

- Describe the basic objectives of the project.
- Identify any potential significant environmental impacts of the project.
- Identify and evaluate alternative locations or sites to determine whether the environmental impacts of the alternatives are the same, better, or worse than the proposed project.
- Identify and evaluate technology alternatives to the project which would mitigate impacts.
- Evaluate the impacts of not constructing the project to determine whether the “no project” alternative is superior to the project as proposed.

## **BASIC OBJECTIVES OF THE PROJECT**

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The applicant identified the following five objectives in its AFC discussion of alternatives (OGE2008a, page 5-1):

- Provide environmentally sound, efficient and reliable power generation using commercially available proven technology to respond to the SDG&E request for offers (RFO) for new generating capacity to support reliability in an environmentally responsible and economically feasible manner;
- Use a site location within SDG&E’s service territory that has infrastructure with available capacity and ability to reliably support Project electric transmission, fuel supply, and water needs with minimal impact on existing infrastructure systems or required new construction;
- Use a site that is commercially available, including control for reasonable access and linear facility easements;
- Develop a site that has compatible zoning, compatible adjacent land uses, and is located away from sensitive receptors; and
- Maximize the capacity of the classes of equipment to be used, consistent with good engineering practice.

The Applicant also indicates that construction is expected to start in April 2009 for commercial operation by October of that year.

## POTENTIAL SIGNIFICANT ENVIRONMENTAL IMPACTS OF THE PROJECT

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Potential issues associated with Orange Grove include traffic (from trucking water to the site) and noise (due to proximity to residential receptors). Staff has concluded that any impacts would be mitigated to levels less than significant by the proposed project.

## SITE ALTERNATIVES TO THE PROJECT

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Staff considered the following criteria in identifying potential alternative sites:

1. Avoid or substantially lessen one or more of the potential significant effects of the project;
2. Satisfy the following criteria:
  - A. Suitable acreage and shape.
  - B. Availability of infrastructure. The site should be within a reasonable distance of natural gas and water supplies. Longer infrastructure lengths would increase the potential for environmental impacts.
  - C. Location in SDG&E service territory.
  - D. Compliance with general plan designation and zoning district.
  - E. Availability of the site.

Staff first identified a study region. The region consists of SDG&E's service territory, which covers San Diego County and the southern part of Orange County. Staff then reviewed the six alternative sites identified by the applicant (OGE2008a, page 5-3). Three of those sites – Borrego Springs, Miramar, and Margarita – were offered by SDG&E in the RFO referenced above. The other sites (GCL North, GCL South, and Rainbow) are in the vicinity of the Orange Grove site. Staff also identified three additional sites near SDG&E substations: San Luis Rey, Talega, and Sycamore. Staff visited the alternative sites to investigate their suitability and to ascertain their general availability. **Alternatives Figure 1** identifies the locations of all sites considered as alternative sites to the Orange Grove Project.

## SITES INITIALLY IDENTIFIED FOR FURTHER EVALUATION

Six of the nine alternative site locations referred to above were rejected for a variety of reasons. These sites and the reasons for rejection are as follows:

### Sites not Meeting Screening Criteria

- **Borrego Springs Alternative Site.** This two-acre site in Borrego Springs, a town surrounded by Anza Borrego State Park, features graded, undeveloped desert land. The site's size would allow the generation of only 15 MW, and therefore would not achieve the requested generating capacity and is eliminated from further consideration.

- **Miramar Alternative Site.** Located at the existing Miramar Energy Facility in the City of San Diego, this site allows a maximum peaking capacity of 49MW. SDG&E filed an application in June 2008 for expedited approval of a peaker at the site. Staff has thus not retained the site for further analysis.
- **GCL South Alternative Site.** This site is a disturbed area with former dairy farms 0.65 miles south-southwest of the Orange Grove project site. It is clearly visible from SR-76 and is in close proximity to the San Luis Rey River's riparian habitat, which supports the federally endangered least Bell's vireo and arroyo toad. Owned by Gregory Canyon Ltd., the land is required for mitigation of the company's Gregory Canyon Landfill. If the power plant were sited here, the landfill would have to find equivalent mitigation elsewhere (Data Response Workshop, 9/11/08). Because of this land restriction, the site is not retained for further analysis.
- **Margarita Alternative Site.** This site in Ladera Ranch (southern Orange County) would not have sufficient generation capacity (TRC2008e). In addition, community opposition to power plant development does not make it a preferred option. In May 2008, Wellhead Power Margarita, LLC withdrew an application for a 46 MW peaker at the site.
- **Rainbow Alternative Site.** This site is in a rugged, remote area of unincorporated Rainbow, southwest of Temecula. Development of the site would require improving narrow, rural roads; constructing a new substation and up to four or more miles of gas pipeline; and securing easements for access and gas line construction from multiple landowners. Plant operations would require continued transport of water. With extensive new construction requirements and feasibility concerns, this site will not undergo further consideration.
- **San Luis Rey Alternative Site.** Staff identified this "site" near the San Luis Rey substation in Oceanside. The substation is surrounded by residential development to the west, south, and east and by a steep drop-off to the north. Vacant land on the southwest corner of the S. El Camino Real and Mesa Drive intersection in close proximity to the substation is bisected by a creek. Due to the lack of suitable space, this site is not retained.

### **Sites Meeting Screening Criteria**

Staff is retaining the following alternative sites:

- **GCL North Alternative Site.** Gregory Canyon Ltd. owns this site on the north side of SR 76. Surrounded by steep ridges, it is almost one mile removed from the nearest residence. The site would affect nine acres: a 6-acre grading footprint plus a 3-acre fire protection fuel modification zone. A new 0.5 to 0.7 mile overhead transmission interconnection would cross SR 76 twice and follow the existing 69 kV transmission route across the hillside to the Pala substation.

Analysis Given the distance to the nearest residence, noise impacts would be reduced. Only two residences would be able to view the power plant, which is also less visible from the highway than the proposed site. The water trucking distance would be shortened by one mile, and the segment of the gas pipeline that cuts across the hillside would not be required. On the other hand, abandoned buildings currently on the site would need to be demolished and the material removed. Due to

topographic and geologic features, blasting would be needed prior to construction. While the power plant itself is less visible, the longer transmission line interconnection would add to the project's visibility.

- **Talega Alternative Site.** Staff identified this undeveloped "site" south of the Talega Substation. Surrounded by low hills, the substation is situated above the San Mateo Creek canyon. The U.S. Marine Corps Base Camp Pendleton is to the south and the city of San Clemente is to the northwest. Development over the last several years has brought commercial and residential buildings to within 0.25 miles of the substation.

Analysis: The site could not encroach on San Onofre State Beach Park or Northrop Grumman property, located to the south and northeast, respectively. Transmission is easily accessible. Water and natural gas infrastructure may need to be developed. If trucking of water were required, trucks would likely pass through residential areas. While the nearest residential receptors are approximately 0.25 miles from the substation, a ridge blocks the site from view. The power plant could be visible from the San Mateo Creek canyon below, Interstate 5 to the west, and a campground 0.5 miles to the northwest. Nearby lands of Camp Pendleton contain native grasslands and coastal sage scrub, which support a variety of species including the federally threatened California gnatcatcher (*Polioptila californica*). Surveys of the area surrounding the site would be required to assess any potential significant impacts to biological resources.

- **Sycamore Alternative Site.** Staff also identified this "site" near the Sycamore substation, south of Poway and immediately north of the Marine Corps Air Station Miramar. Undeveloped hills surround the substation, although new subdivisions are under construction to the north. Suitable acreage may be available, but would require significant grading. Further analysis would be required to assess water and gas availability.

Analysis: Transmission is readily accessible. Residential receptors, however, are within 0.5 miles of the substation, and land development patterns may preclude availability of the site. The site is situated just north of the Marine Corps Air Station (MCAS) Miramar, which serves as an important habitat linkage for a wide variety of wildlife species (MCAS Miramar 2000). Potential adverse impacts on biological resources would need close evaluation.

These alternative sites generate potential impacts of their own and do not offer significant advantages over the proposed Orange Grove site. Furthermore, they do not appear to reduce concerns relating to transportation impacts from water delivery.

## GENERATION TECHNOLOGY ALTERNATIVES

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### CONSERVATION AND DEMAND SIDE MANAGEMENT

One alternative to meeting California's electricity demand with new generation is to reduce the demand for electricity. Such *demand side*<sup>1</sup> measures include programs that increase energy efficiency, reduce electricity use, or shift electricity use away from *peak*<sup>2</sup> hours of demand.

In California there is a considerable array of demand side programs. At the federal level, the Department of Energy adopted national standards for appliance efficiency and building standards to reduce the use of energy in federal buildings and at military bases.

At the state level, the Energy Commission adopted comprehensive energy efficiency standards for most buildings, appliance standards for specific items not subject to federal appliance standards, and has the authority to create and implement load management standards. The Energy Commission also provides grants for energy efficiency development through the Public Interest Energy Research (PIER) program.

The California Public Utilities Commission, along with the Energy Commission, oversees investor-owned utility demand side management programs financed by the utilities and their ratepayers. At the local level, many municipal utilities administer demand side management and energy conservation programs. These include subsidies for the replacement of older appliances through rebates, building weatherization programs, and peak load management programs. In addition, several local governments have adopted building standards which exceed the state standards for building efficiency, or have by ordinance set retrofit energy efficiency requirements for older buildings. New buildings may combine the need for heat and power through a single fuel source or a common source may supply heating and/or heating and cooling to a number of adjacent buildings, increasing overall efficiency.

Even with this great variety of federal, state, and local demand side management programs, the state's electricity use is still increasing as a result of population growth and business expansion. Current demand side programs are not sufficient to satisfy future electricity needs, nor is it likely that even more aggressive demand side programs could accomplish this, given the economic and population growth rates of the last 10 years.

Therefore, although it is likely that federal, state, and local demand side programs will receive even greater emphasis in the future, both new generation and new transmission facilities will be needed in the immediate future and beyond in order to maintain adequate supplies.

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<sup>1</sup> Planning, implementation, and evaluation of utility-sponsored programs to influence the amount or timing of customers' energy use

<sup>2</sup> Time of day when demand for electricity is at its highest

## RENEWABLE ENERGY ALTERNATIVES

Staff also considered renewable energy sources. Although viable, these technologies do not have the quick start-up and shut-down capabilities for peaking power needs. In addition, they are not suited to the proposed site as follows.

- **Solar.** Solar photovoltaic technology uses semiconductors to directly convert sunlight to electricity. Alternately, solar thermal technology – including parabolic trough, power tower, and Stirling engine – converts the sun's energy to heat for utilization by conventional generator equipment. Land requirements can be extensive; depending on the technology, a 96 MW solar plant could require from 380 acres to 960 acres of flat land – acreage that is not available in the San Luis Rey River canyon. Furthermore, the area has insufficient solar resources (under 6.0 kWh/m<sup>2</sup>/day) for utility-scale power generation (NREL 2007).
- **Wind.** Wind carries kinetic energy that can be utilized to spin the blades of a wind turbine rotor and an electrical generator, which then feeds alternating current (AC) into the utility grid. Wind turbines currently being manufactured have power ratings ranging from 250 watts to 1.8 MW (AWEA 2004). Land use requirements average 5.4 acres/MW (CEC 2008), although the turbine footprints only involve 5% of the area (AWEA 2004). Environmental impacts include bird and bat collisions and visual pollution. The Orange Grove site is in an area of poor to marginal wind resource potential (EERE 2008), and a utility scale wind farm would not be viable.
- **Geothermal.** Steam or high-temperature water from geothermal reservoirs is harnessed to drive steam turbine/generators. Geothermal plants range in size from under 1 MW to 110 MW, and require 0.2 to 0.5 acre/MW. Geothermal plants provide highly reliable base-load power, with capacity factors from 90- 98%. Plants, however, must be built near geothermal reservoir sites, as steam and hot water cannot be transported long distances without significant thermal energy loss. There are no known geothermal resources in San Diego County (CEC 2005).
- **Biomass.** Electricity is generated by burning organic fuels in a boiler to produce steam, which then turns a turbine. Biomass can also be converted into a fuel gas such as methane and burned. Major biomass fuels include forestry and mill wastes, agricultural field crop and food processing wastes, and construction and urban wood wastes. Biomass facilities do not require an extensive amount of land, but only produce small amounts of electricity (in the range of 3 to 10 MW). Furthermore, there is no large fuel source in the area of the proposed project, and ongoing truck deliveries would be required to supply the plant with the biomass fuel.
- **Tidal and Wave.** Tidal generation of electricity involves building a dam, known as a barrage, across a bay or estuary. Water retained behind a dam at high tide produces a power head sufficient to generate electricity as the tide ebbs and water released from within the dam turns conventional turbines. Wave energy technologies -- which include terminator devices, point absorbers, attenuators, and overtopping devices – extract energy from surface wave motion or subsurface pressure fluctuations (MMS 2007). These tidal and wave technologies, many of which are in the research and development stage, would not apply to the inland site.



## GENERATION TECHNOLOGY AND COOLING ALTERNATIVES

The proposed generation technology consists of two GE LM6000 PC combustion turbine generators (CTGs), equipped with SPRay-INTercooled (SPRINT) power boost technology. Inlet air chillers are cooled by an evaporative cooling system.

Staff considered generation and cooling alternatives to reduce environmental impacts, particularly the trucking of 87.3 acre-feet per year (AFY) of water to the site. Water saving substitutions could involve exchanging the GE LM6000 PC SPRINT CTGs with GE LM6000 PD non-SPRINT CTGs, and the evaporative cooling with a dry cooling system. The alternatives include the following:

- **Combustion turbine generator.** To reduce the production of nitrogen oxides, the proposed GE LM6000 PC generators inject water into the combustor (OGE2008a, page 5-20), on the order of 29.5 gallons per minute (average annual rate) of fresh water (Appendix 2-D). Alternately, LM6000 PD generators utilize a dry low emissions combustor, eliminating the need for water injection.
- **SPRINT.** The proposed SPRINT power boost technology increases output during warm or hot ambient conditions (OGE2008a, page 2-9), but consumes fresh water at an average rate of 12.1 gallons per minute (page 2-15 and Appendix 2-D). If the SPRINT technology were not used, water consumption would be reduced. The power output, however, of the LM6000 PD non-SPRINT generators would be 82 MW, compared to 96 MW with LM6000 PC SPRINT generators (OGE2008a, page 5-13).
- **Cooling system.** Use of a dry cooling system in place of the proposed evaporative cooling system (for cooling inlet air chillers) would reduce the net consumption of 24 gallons per minute of reclaimed water (OGE2008a, page 2-16). It would also reduce output by approximately 3.2 net MW (OGE2008a, page 5-29), and increase the project footprint by 1,500 square feet (page 5-30).

The water saving features described above would reduce the overall output, and increase the parasitic load. More units (with a potentially greater footprint) would be required to produce 96 MW.

## ALTERNATIVE LINEAR ROUTES

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A 0.3 mile underground electric transmission line would connect the plant to a 69-kV bus at the existing Pala substation. Since transmission access would be within SDG&E property boundaries, there no alternatives are identified.

A 2.4 mile natural gas pipeline would link to an existing SDG&E transmission main, located near the intersection of Rice Canyon Road and SR 76. Heading west from the proposed site, the new pipeline route would parallel the transmission interconnection, traverse the hillside southwest of the substation (primarily along existing unpaved roads), and cross SR-76 0.4 miles south of the Pala substation. From there, the pipeline would follow the highway, in previously disturbed areas or in the SR 76 right-of-way.

The Applicant considered – but eliminated due to concerns about construction traffic and CalTrans requirements – an alternative alignment that would follow SR 76 for the

entire pipeline route. Under such an alignment, the pipeline would not cross the hillside just southwest of the Pala Substation, and thus would not directly disturb coastal sage scrub habitat. Any other alternatives, however, would likely traverse more habitat than the proposed route.

The Project would also include a freshwater and a reclaimed water pickup station at Fallbrook Public Utility District facilities, where water trucks would be filled for hauling to the site. The Applicant determined these pickup stations to be the only compatible water supply options (OGE2008a, pg. 5-8). The 15.6-mile route from the reclaimed water station and the 9-mile route from the freshwater station (pg. 2-19) appear the most practical.

## THE “NO PROJECT” ALTERNATIVE

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The “No Project” alternative under CEQA assumes that the project is not constructed. In the CEQA analysis, the “No Project” alternative is compared to the proposed project and determined to be superior, equivalent, or inferior to it. The *CEQA Guidelines* state that “the purpose of describing and analyzing a No Project Alternative is to allow decision makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project” (Cal. Code Regs., tit. 14 §15126.6(i)). Toward that end, the “No Project” analysis considers “existing conditions” and “what would be reasonably expected to occur in the foreseeable future if the project were not approved...” (§15126.6(e)(2)). *CEQA Guidelines* and Energy Commission regulations require consideration of the “No Project” alternative. The no-action alternative is compared to the effects of constructing the proposed project. In short, the site-specific and direct impacts associated with the power plant would not occur at this site if the project does not go forward.

Selection of the “No Project” alternative would render all concerns about project impact moot. The “No Project” alternative would preclude any construction or operation and, thus, grading of the site or installation of new foundations, piping, or utility connections. Trucking of water to the site would not occur.

If the project were not built, the region would not benefit from the local and efficient source of 96 MW of new generation that this facility would provide. A primary benefit of the Orange Grove project is that it would serve peak load demands in the SDG&E service area. The Orange Grove project would also have ability to compensate for the intermittency of solar and wind plants.

In the absence of the Orange Grove project, however, other power plants could likely be constructed in the project area or in San Diego County to serve the demand that could have been met with the Orange Grove project. New plants constructed in the area would likely have similar air quality effects as those of the proposed Orange Grove. If no new natural gas plants were constructed, SDG&E may have to rely on older power plants. These plants could consume more fuel and emit more air pollutants per kilowatt-hour generated than the Orange Grove project. In the near term, the more likely result is that existing plants, many of which produce higher level of pollutants, could operate more than they do now. The “No Project” alternative does not appear to be environmentally superior to the Orange Grove project.

## RESPONSE TO AGENCY AND PUBLIC COMMENTS

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No comments pertaining to Alternatives were received.

## CONCLUSIONS AND RECOMMENDATION

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Staff has analyzed in detail project site, generation technology, and linear route alternatives; renewable energy alternatives; conservation measures; and the “No Project” alternative. The mitigation proposed for the project is adequate to lessen any potentially significant environmental impacts to a less-than-significant level, and staff has determined that the preferable alternative is the proposed project using suggested mitigation. Therefore, no alternative is recommended over the proposed project.

## REFERENCES

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California Energy Commission (CEC). 2005. “Map of Geothermal Resources in California.” <[http://www.energy.ca.gov/maps/geothermal\\_areas.html](http://www.energy.ca.gov/maps/geothermal_areas.html)>.

Gregory Canyon Landfill Environmental Impact Report.  
<<http://www.sdcounty.ca.gov/deh/waste/pdf/chd/gc/eir/>>.

OGE2008a – OGE/S. Thome (tn46770) Application for Certification Orange Grove Energy dated 6/19/08. Submitted to Dockets 6/19/08.

TRC2008e – J. Stenger (tn47854) Data Responses 1-73 dated 8/29/08. Submitted to Dockets 8/29/08.

U.S. Department of Energy, Energy Efficiency and Renewable Energy (EERE). 2008. “California Wind Resource Map.”  
<[http://www.eere.energy.gov/windandhydro/windpoweringamerica/maps\\_template.asp?stateab=ca](http://www.eere.energy.gov/windandhydro/windpoweringamerica/maps_template.asp?stateab=ca)>.

U.S. Department of Energy, National Renewable Energy Laboratory (NREL). 2007. “Concentrating Solar Power Resource Maps.”  
<<http://www.nrel.gov/csp/maps.html>>.

U.S. Department of the Interior, Minerals Management Service (MMS). 2007. “OCS Alternative Energy and Alternate Use Programmatic EIS, Ocean Wave Energy.”  
< <http://ocsenergy.anl.gov/guide/wave/index.cfm>>.

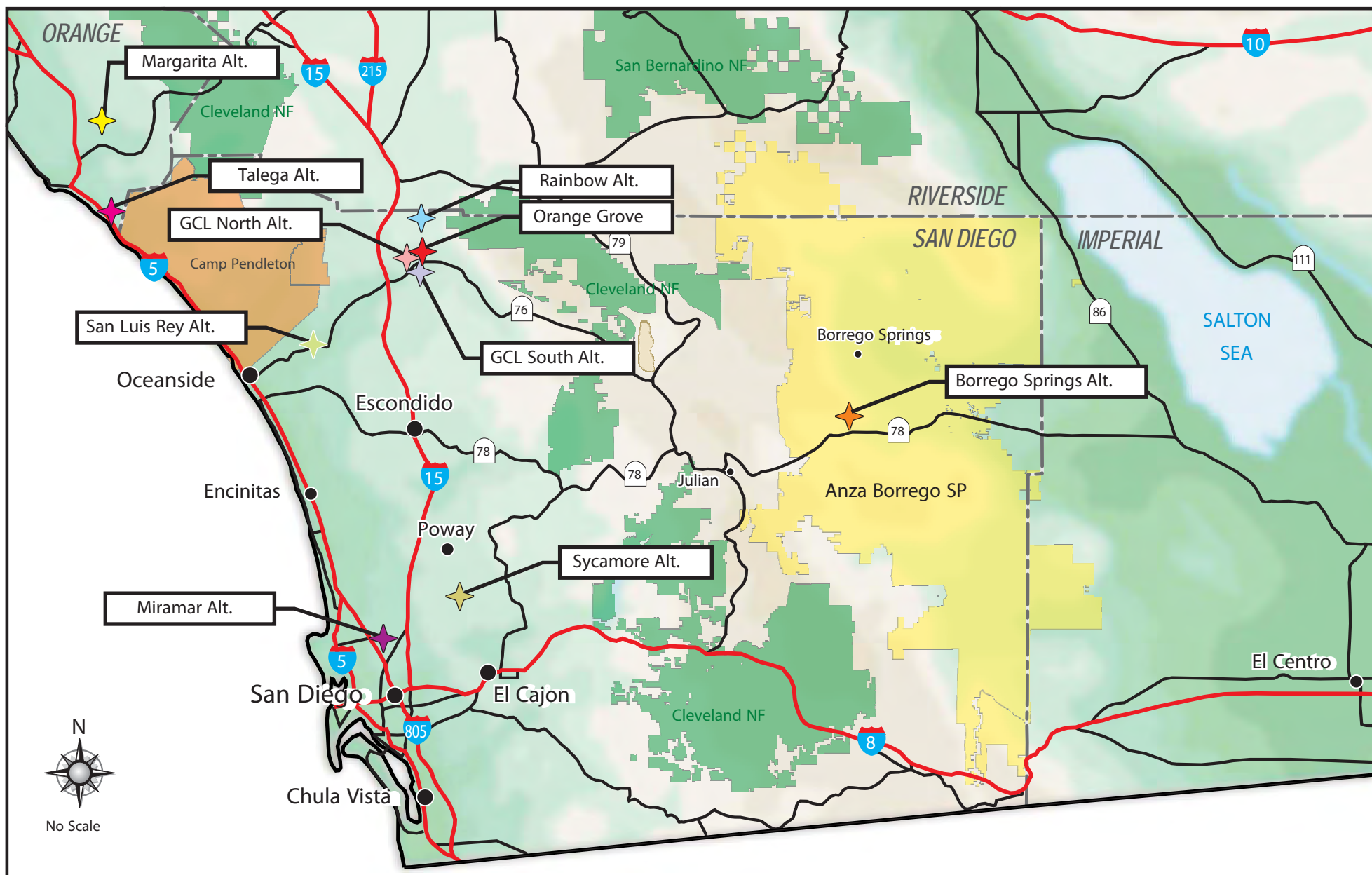


Figure 1